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(54) Complete diet foods

(57) A food composition for the manufacture of foods capable of reducing dietary caloric intake to minimum requirements, comprises proteins, caloric sources, vitamins and mineral components in a well-balanced ratio. Foods may comprise wheat flour, skim milk, whole egg, egg white, cottonseed oil, butter, sugar, polished rice, soy bean flour, vitamins and minerals. A packaged composition is disclosed.

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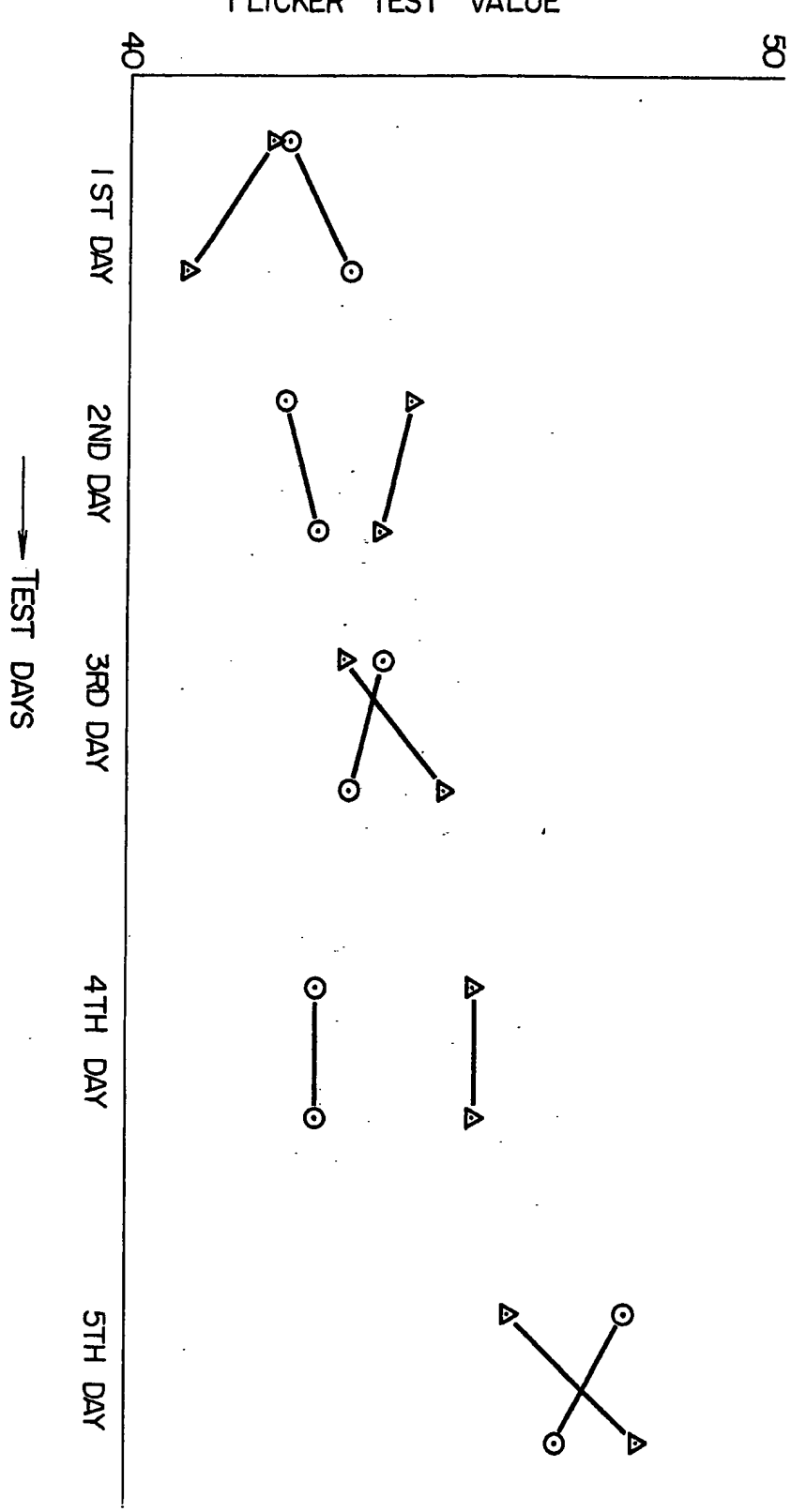

FIGURE

SPECIFICATION

Food compositions

This invention relates to a food composition. More particularly, it relates to a food composition for the manufacture of perfect foods capable of reducing dietary caloric intake to minimum requirements, comprising proteins, caloric sources, vitamins and mineral components in a well-balanced combination; and to perfect foods manufactured from said composition.

In those days such as the World War II and post-war times when food supply became tight, the caloric supply was the core of nutrition improvement plan. However, as the food situation has been improved in recent years, evil effects of an excessive caloric intake such as, for example, diseases of internal organs due to obesity have become more often pointed out.

Under the circumstances, a variety of manufactured foods such as non-calorie foods, non-fat foods, or nutritiously enriched foods with added vitamins or other components have become commercially available. In view of the balance of nutrients, however, many of such commercial foods cannot but be called very defective because of the imbalance among nutrients. On the other hand, it is very difficult for the public, except for skilled specialists, to prepare daily meals with due regard to the balance of nutrients, even though abundant food materials arrive on the market at present. Those hard crackers and other foods which have been known as emergency foods are hardly called turely excellent foods in view of the balance of nutrients, because emphasis is placed on the caloric content, as judged from the composition of blended components.

In consideration of the above-stated actual circumstances, the present inventor conducted extensive studies and, as a result, has now accomplished this invention.

An object of this invention is to provide a food composition for the manufacture of perfect foods capable of reducing dietary caloric intake to minimum requirements, comprising proteins, caloric sources, vitamins and mineral components in a well-balanced combination.

Another object of this invention is to provide a perfect food manufactured from the said composition.

A further object of this invention is to save caloric food resources.

The accompanying drawing is graphic representation of the comparison of flicker values between the group fed with the food of this invention and the group fed with a conventional perfect food. Each flicker value shows the result obtained after 15 minutes of exercise simulating the bicycle driving. In the test a two-fold load was imposed on the fifth day.

△... Flicker value of the group fed with the food prepared from the composition of this invention.

⊙... Flicker value of the group fed with a conventional perfect food.

Generally, each nutrient is specific in physiological action and its minimum requirement depends on the requirement of its own as well as on the proportions to other nutrients.

Nutrients are divided broadly into two classes of caloric nutrients and non-caloric nutrients. The caloric nutrients include protein, fat and carbohydrate which are called three major nutrients. The sum total of calories contained in the major nutrients is the gross caloric content. Requirement for the gross caloric content depends on the basal metabolic rate of an individual, type and quantity of labor, and the proportions among three major nutrients.

Independent of the caloric intake, the requirement for proteins depends on nitrogen excretion (urination, cutaneous dissipation, sweating, defecation, etc.) and other factors (for example, loss in digestion and absorption, requirement due to stresses, individual variation, etc.). These factors are those considered from the side of the living body. The factor on the part of protein is its nutritional quality which is expressed in terms of amino acid score, the amino acid score of a perfect protein being 100.

When the protein requirement is settled in the above way, the caloric content of the protein can be computed.

The composition of the invention contains in the range of from 25 to 64g of protein calculated as perfect protein. The term "perfect protein" is an indication of the requirement of essential amino acids which the human body cannot synthesise and the term particularly refers to a theoretical protein pattern suggested by the joint Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) Committee (1973). This protein pattern comprises 8 essential amino acids in milligrams per gram of protein as follows:

70mg of leucine
60mg of phenylalanine plus tyrosine
55mg of lysine
50mg of valine
40mg of isoleucine
40mg of threonine
35mg of methionine plus cystine
10mg of tryptophan

This gives a total of 360 milligrams per gram of protein. In terms of perfect protein the recommended daily intake is 56 grams of protein for an adult male of 70 Kg body weight.

Using this concept of "perfect protein" an amino acid score and a protein score can be calculated for any protein or composition comprising a protein. The amino acid score may be calculated by the following formula:

$$\text{amino acid score} = \frac{\text{(milligrams of amino acid in 1 gram of test protein)}}{\text{(milligrams of amino acid of theoretical protein)}} \times 100\%$$

The amino acid score of a protein is usually considered as the amino acid score of the most limiting amino acid in that protein. Thus if the most limiting essential amino acid in a protein is 80% of the theoretical or perfect protein then for that protein

$$\text{amino acid score} = \frac{80}{100} \times 100 = 80$$

The protein score of a protein, or a composition comprising a protein, is the percentage ratio of the perfect protein content to the actual amount of protein present.

The fat requirement is determined so as to allow the ingestion of essential fatty acids as far as possible and the caloric intake via fats is limited at most to 60 cal% (preferably 20 to 40 cal%) of the gross caloric content.

The requirement for carbohydrates corresponds to the remainder obtained by subtracting the sum of caloric content of the protein and that of the fat from the gross caloric content. The sucrose intake is limited to 60 g/day or less.

From the above description, it is apparent that the following relationship holds:

(Gross calories) − (Calories from protein) = (Calories from fat and carbohydrate)

Non-caloric nutrients may be divided into two broad categories of vitamins and inorganics.

The vitamin requirement is that necessary for the prevention of avitaminosis and hypovitaminosis and if hypervitaminosis is expectable, the upper limit of the vitamin in question is set so as not to cause the disturbance. However, because of being a metabolizing catalyst, vitamins vary in requirement depending on the quality and quantity of other nutrients and/or the type and quantity of the labor. For instance, the consumption of vitamin B_1 increases with the increase in carbohydrate intake or in the case of mental work; the consumption of vitamin C becomes higher with the increase in body temperature due to fever for example or with the increase in stress; and the consumption of pantothenic acid is enhanced by a high fat intake.

The roles played by the minerals include catalytic action on metabolism, maintainance of pH levels in body fluids, and constructive elements of the human body. The requirement of minerals for the purpose of catalytic action and maintainance of pH levels varies depending on the intake of other nutrients. Some minerals are required to maintain certain proportions among them. The minerals as the constituents of the body should be replenished with the quantity corresponding to their daily consumption, except for the growth period.

An ideal human diet is based on the so-called each meal perfect (EMP) system which means that both quality and quantity of every meal are perfect. In actual daily life, however, the chances of taking meals on the EMP basis are very rare, except for the nutritional specialist.

The perfect meal, as herein referred to, means a meal which contains essential nutrients in a combination nost adequate in quality and quantity for the perfect nutrition. Since it is practically impossible to prepare a perfect meal for each individual, actual meal must rely to some degree on the adaptive function of the human body. A meal of lesser degree of dependence on the adaptive function may be considered to be better one.

The diet on the EMP basis is a better sytem than the perfect meal on daily basis, because if each meal is imperfect, the latter system becomes more dependent on the adaptive function.

However, the daily preparation of such an excellent EMP must rely on the adequate and strict instruction of a specialist and, hence, is almost impracticable for the public. Moreover, even though the meals on the EMP basis are served, the perfectness of the diet will be lost if the meals are left unfinished or if a snack is taken between meals. If one has a snack between each perfect meals, the overeating tends to result in excessive caloric intake.

In order to avoid excessive or deficient nutritional intake, there are needed both the supply of perfect meals and the nutritional instruction of a specialist. A perfect nutritional intake can be ensured solely by taking such measures. However, the perfect meal is difficult to realize for the reasons that one has become less mindful nowadays about the nutrition on account of the displayed abundance of food; one appreciates the perfect meal but not dares to put it into daily practice; and it is a general tendency to give priority to the taste. Moreover, most people have no means of taking a perfect meal, have little information about the perfect meal, and, hence, their daily means remain to relay to a great extent on the nutritional adaptivity of the human body.

In consideration of the above-noted problems arising from the existing dietary condition, the present invention is to supplement the imperfect balance of nutriments.

As to the caloric requirement, it is an ideal way to take in the recommended allowance per day (RA/day) from the perfect meal. If one takes tea or coffee with caloric sources such as sugar and/or milk as a snack, the caloric intake becomes in excess by the caloric content of the snack. Since it is difficult to exclude all snacks from the social life at present, the actual daily caloric intake often becomes RA/day plus caloric content of the snack.

In the food composition according to the present invention, by taking into account the above circumstances, the caloric content is prescribed to correspond to 90% of RA/day, the balance (10%) being supplemented by the snack. If the snack is not taken, the daily caloric intake will become 90% of RA/day. The 10% reduction in the caloric content is based on

the following information obtained by the present inventor:

(1) The results of observation made on the rats raised for a long period of time showed that the rat group fed with foods of lower caloric content lives longer than other groups, if other food components are perfect in both quality and quantity.

(2) Since an excessive labor or the reduction of diet decreases the basal metabolic rate 10% reduction in caloric requirement can be easily achieved (reduction up to 20% is possible).

(3) The results of test conducted on human individuals showed that the reduction in caloric intake has no adverse effect such as an increase in fatigue, as evidenced by the normal flicker value immediately after an exercise which simulated bicycle driving and, hence, a 10% reduction in caloric intake is effective and adequate.

As for the protein intake, it has been generally believed that an excessive intake of two to three times RA/day is undesriable, because it has been known that the excess protein increases the burden on kidney which excretes the protein after converting it into urea and that in the course of metabolism a part of protein is not completely converted into urea, resulting in metabolic anomaly. For instance, gout and diabetes, which are the diseases in modern life, are said to be partly caused by the high caloric and high protein intake. A deficiency in the protein intake is of course injurious to health.

By taking the above points into account, the protein content of the food composition was fixed at a value exceeding the RA/day by 10%, because when stress is imposed the protein requirement is said to increase in order to provide the material for the synthesis of hormones. Although RA/day was calculated by taking the above-noted points into account, an additional amount of 10% was further added to the food composition of this invention in view of the increased environmental stresses at present.

The vitamin B_1 content was also increased by 20% above the RA/day, because of the recent increase in mental work and in avitaminosis B_1. This additional amount of vitamin B_1 seems adequate in view of the knowledge that in the case of mental work, even if 3,000 γ of vitamin B_1 was administered, no excretion into urine has been observed.

The vitamin C content was also increased by 20% above the RA/day for the purpose of meeting the increased requirement for vitamin C under increased stress conditions and for the purpose of keeping the individuals from infectious diseases, the incidence of which increases with the advances in traffic facilities. Cholesterol is excreted in the form of cholic acid and vitamin C is required for the conversion of cholesterol into cholic acid. Since an excessive intake of cholesterol and a high fat intake are said to be partial cause for hypercholesterolia and, in its turn, arteriosclerosis, a high intake of vitamin C is preferred.

The flicker test mentioned hereinbefore and hereinafter is the determination of what is known as the flicker fusion threshold (fusion frequency or critical fusion frequency) i.e. the number of flashes of light per second at which the light just appears to the subject under test to be continuous. The term "flicker" is applied to the visual sensation produced by intermittent flashes of light wherein the flashes occur at a certain rate for example by means of a stroboscope. Depending on the frequency of the light flashes the flashes may appear to flicker or to be steady; this is the flicker phenomenon. The flicker test itself is used in the diagnosis of existent or incipient high blood pressure and in the determination of physiological fatigue. A low flicker fusion threshold indicates disease, physiological disorder or fatigue.

The Donaggio reaction, reported by A. Donaggio in 1931, is also a method of determining the degree of physiological fatigue. This test is carried out on urine and determines the amount of substances in the urine which inhibit the reaction of methylene blue with molybdenate to form precipitates. It is now thought that these colloidal, protein-like inhibiting substances are mucoproteins.

The following Examples illustrate the invention.

Example 1 Preparation of Rice Cracker.

One hundred grams of eggs were beaten well and whipped. In another vessel 15g of powdered skim milk 10 g of white sugar, and suitable amounts of inorganic ingredients mixed with glucose were dissolved in 30 g of water to form a thoroughly uniform aqueous mixture. In 7 g of cotton seed oil, were dissolved 2,000 international units (IU) of fat-soluble vitamin A, 100 IU of vitamin D and 15 mg of vitamin E. The resulting solution was mixed with 18 g of lard and 39 g of butter and then admixed with 150 g of rice flour and 60 g of mashed carrot to form a uniform mixture. This mixture was slowly added with stirring to the whipped egg obtained above and further admixed with 200 g of rice flour and the aqueous mixture. The mixture was kneaded lightly, flattened by rolling, and small pieces were cut out by means of a die. The amount of water can be varied as desired. The cutout pieces were baked on a shallow pan in an oven at 150-180°C for 5 to 15 minutes. After cooling, the baked product was sprayed with a saturated solution of water-soluble vitamins (containing 1.2 g of vitamin B_1, 1.3 g of vitamin B_2, 2 g of vitamin B_6, 2 g of vitamin B_{12} and 60 mg of vitamin C), vacuum-dried and packed. The thus prepared food contained 77.25 g of proteins, 82 g of fats and 295.41 g of carbohydrates, the caloric content being 2,252 Kcal. In terms perfect protein the food contained 56g of protein and thus the protein score of the composition was $(56 \div 77.25) \times 100\% = 72.5\%$.

Example 2 (Preparation of biscuit)

Biscuit was prepared by baking the following composition in a customary way.

Wheat flour (first grade low-protein flour)	320 g
Powdered skim milk	100 g
Whole egg	65 g
Egg white	120 g
Corn oil	17 g
Margarin (or butter)	26 g
White sugar	43 g
Lemon juice	10 g
Dried peanut	5 g

The cooled biscuit was sprayed with a saturated solution of water-soluble vitamins (55 mg of vitamin C and 0.4 g of vitamin B_1) to obtain the product.

The product biscuit contained about 80 g of proteins, about 54 g of fats and about 340 g of carbohydrates in total, the caloric content being about 2,250 Kcal. In terms of perfect protein the biscuit contained 56g of protein and thus protein score was (56 ÷ 80) × 100% = 70%.

Example 3

Healthy young men of average build, 54 to 64 kg in weight and 20 to 21 of age, were selected as subjects and fed for 5 days with the test food prepared in the same manner as in Example 1. A perfect food having a standard caloric content of 2,500 Kcal was used as control. The caloric content of the test food was lower than the standard caloric content by about 10%. The protein content was higher by about 10%, because it was well known that excretion of the protein is promoted under imposed stress. Vitamins C and B_1 were increased by 20% and vitamins B_2 and B_6 by 10%.

The subjects were divided into two groups. The group A received a common perfect food as control and the group B was fed with the test food. Both groups A and B were fed with common perfect meals for earlier three days, and then the group B was fed with the test food for the remaining test period. After two days, a daily exercise simulating bicycle driving for 15 minutes was imposed for 5 days. Before and after each exercise, the flicker value, health condition, vitamin C content of urine, Donaggio reaction of urine, and urobilinogen reaction were tested for comparison.

The quantity of meal fed to each subject of both groups was varied by calculating precisely the caloric requirement in accordance with age, surface area of the body and the results of time study. Vitamin C was not added to the meal but orally administered as a solution at each meal time in an amount corresponding to one-third of daily intake.

The results of flicker test was as shown in the accompanying Drawing. The group B (test diet) showed better Donaggio reaction value and urobilinogen level. The vitamin C content of urine was as shown in Table 1.

Table 1. Vitamin C content of urine (mg/100 ml)

Test period	*A (control group)*	*B (test group)*
1st day	0.5604	0.5866
2nd day	0.5591	0.5921
3rd day	0.5622	0.5991
4th day	0.5609	0.6001
5th day	0.5700	0.6020

As seen from the above results, the test meal according to this invention permits the subjects to maintain the daily life comparable to that of the subjects fed with a meal on EMP basis. The group fed with the test meal showed rather better resistance to fatigue as compared with the control group. Therefore, the food according to this invention keeps the individuals from taking surplus caloric nutrients and thus wasting the food.

Example 4 (Preparation of soup)

A premix was prepared from the following constituents:

Skim milk	100 g
Whole egg	65 g
Egg white	120 g
Corn oil	17 g
Margarin	26 g
Corn starch	28 g
Lemon juice	10 g

Although potage can be prepared from the above premix in a customary way, the product of this Example was prepared in the following way:

The premix was dissolved in water with heating and transformed into a powder form in a suitable way to obtain a base stock for ready-to-eat foods. In order to enrich in vitamins, 1,000 IU of vitamin A, 100 IU of vitamin D, 0.7 mg of vitamin B_1, 55 mg of vitamin C were added to the base stock and sealed up.

A rice cracker was prepared by baking the mixture of commercial batter of rice cracker (330 g), green laver (1 g) and dried peanut (5 g). A food product comprising the rice cracker accompanied by the powdered soup can be prepared.

The combined nutrients content of the rice cracker and the powdered soup is as follows:

Proteins	about 83 g
Fats	49 g
Carbohydrates	56 g
Calories (Kcal)	2,250
Vitamin A	1,900 IU
" D	100 IU
" E	18 mg
" B_1	0.5 mg
" B_2	2.6 mg
Nicotinic acid	10 mg
Vitamin B_6	2 mg
" C	60 mg
Calcium	1,220 mg
Phosphorus	1,530 mg
Magnesium	230 mg
Iron	15 mg
Zinc	10 mg

In terms of perfect protein the combined rice cracker and powdered soup contained 56g of protein and thus the protein score was (56 ÷ 83) × 100 = 67%.

The amounts of vitamin B_1, nicotinic acid and magnesium may be increased to the amounts within the preferred range for these constituents in a composition of the invention, for example by spraying or coating the rice cracker or by addition to the powdered soup.

CLAIMS

1. A composition which comprises
proteins 25-64(g) (as perfect protein)
calorie sources 2250-2700 Kcal
vitamins:
vitamin A750(IU)
vitamin D ≥ 100(IU)
vitamin E ≥ 9(IU)
vitamin B_1 ≥ 0.5(mg)
vitamin B_2 ≥ 1.4(mg)
nicotinic acid ≥ 10(mg)

vitamin $B_6 \geq 1.5$(mg)
folic acid ≥ 200 (γ)
vitamin $B_{12} \geq 2.0$(γ)
vitamin C ≥ 36(mg)
minerals:
calcium ≥ 400(mg)
phosphorus ≥ 700(mg)
magnesium ≥ 230(mg)
iodine ≥ 100(γ)
iron ≥ 6.0(mg)
zinc ≥ 9(mg)

2. A composition as claimed in claim 1, which comprises
proteins 25-64(g) (as perfect protein)
calorie sources 2250-2700 Kcal
vitamins:
vitamin A ≥ 750(IU)
vitamin D ≥ 100(IU)
vitamin E ≥ 9(IU)
vitamin $B_1 \geq 1.2$(mg)
vitamin $B_2 \geq 1.4$(mg)
nicotinic acid ≥ 17(mg)
vitamin $B_6 \geq 1.5$(mg)
folic acid ≥ 200(γ)
vitamin $B_{12} \geq 2.0$(γ)
vitamin C ≥ 36(mg)
minerals:
calcium ≥ 400(mg)
phosphorus ≥ 700(mg)
magnesium ≥ 250(mg)
iodine ≥ 100(γ)
iron ≥ 6.0(mg)
zinc ≥ 9(mg)

3. A composition as claimed in claim 1 or claim 2, wherein vitamin A is present in an amount in the range of from 750 to 5,000 IU.

4. A composition as claimed in any one of claims 1 to 3, wherein vitamin D is present in an amount in the range of from 100 to 400 IU.

5. A composition as claimed in any one of claims 1 to 4, wherein vitamin E is present in an amount in the range of from 9 to 15 IU.

6. A composition as claimed in any one of claims 1 to 5, wherein vitamin B_1 is present in an amount in the range of 1.2 to 1.8 mg.

7. A composition as claimed in any one of claims 1 to 6, wherein vitamin B_2 is present in an amount in the range of from 1.4 to 2.0mg.

8. A composition as claimed in any one of claims 1 to 7, wherein nicotinic acid is present in an amount in the range of from 17 to 20mg.

9. A composition as claimed in any one of claims 1 to 8, wherein vitamin B_6 is present in an amount in the range of from 1.5 to 2.0mg.

10. A composition as claimed in any one of claims 1 to 9, wherein folic acid is present in an amount in the range of from 200 to 400γ.

11. A composition as claimed in any one of claims 1 to 10, wherein vitamin B_{12} is present in an amount in the range of from 2.0 to 3.0γ.

12. A composition as claimed in any one of claims 1 to 11, wherein vitamin C is present in an amount in the range of from 36 to 60mg.

13. A composition as claimed in any one of claims 1 to 12, wherein calcium is present in an amount in the range of from 400 to 800mg.

14. A composition as claimed in any one of claims 1 to 13, wherein phosphorus is present in an amount in the range of from 700 to 800mg.

15. A composition as claimed in any one of claims 1 to 14, wherein magnesium is present in an amount in the range of from 250 to 350mg.

16. A composition as claimed in any one of claims 1 to 15, wherein iodine is present in an amount in the range of from 100 to 150γ.

17. A composition as claimed in any one of claims 1 to 16, wherein iron is present in an amount in the range of from 6 to 18mg.

18. A composition as claimed in any one of claims 1 to 17, wherein zinc is present in an amount in the range of from 9 to 15mg.

19. A composition as claimed in claim 1 or claim 2, wherein the protein is present in an amount of the Recommended Allowance per day plus 10% of the Recommended Allowance, the calorie content is present in an amount of 90% of the Recommended Allowance per day and each of vitamin B_1 and vitamin C is present in an amount of the Recommended Allowance per day plus 20% of the Recommended Allowance.

20. A composition as claimed in any one of claims 1 to 19, wherein as compared with required quantities, protein content is increased by 10%, caloric content is reduced by 10%, vitamin B_1 content is increased by 20%, vitamin B_2 content is increased by 10% and vitamin C content is increased by 20%, the iron being the same as the required quantity.

21. A composition as claimed in any one of claims 1 to 20, which comprises wheat flour, skim milk, whole egg, egg white, cotton seed oil, butter, white sugar, the requisite vitamins, and the requisite minerals.

22. A composition as claimed in any one of claims 1 to 20, which comprises polished rice, whole egg, egg white, skim milk, soy bean flour, cotton seed oil, butter, white sugar, green layer, the requisite vitamins and the requisite minerals.

23. A composition as claimed in any one of claims 1, 2 and 13 to 22, which does not contain any vitamins.

24. A composition as claimed in claim 1 which is described in any one of Examples 1 to 4 herein.

25. A premix which comprises a multiple of or a fraction of a composition as claimed in any one of claims 1 to 22 and 24.

26. A premix as claimed in claim 25, which is in powdered form.

27. A premix as claimed in claim 25 or claim 26, which is in the form of a batter.

28. A premix as claimed in any one of claims 25 to 27, which does not contain any vitamins.

29. A premix as claimed in claim 25, which is described in any one of Examples 1 to 4 herein.

30. A food for a healthy adult male human being which comprises a composition as claimed in any one of claims 1 to 19, 21 to 24 or a premix as claimed in any one of claims 25 to 29, in admixture with a non-nutritional carrier.

31. A food for a healthy adult female human being or for a healthy child which comprises a com-

position as claimed in any one of claims 1 to 18, & 20 to 24 or a premix as claimed in any one of claims 25 to 29, in conjunction or admixture with a non-nutritional carrier.

32. A process for the preparation of a food as claimed in claim 30 or claim 31, which comprises

a) cooking a composition as claimed in any one of claims 1 to 22 and 24 or a premix as claimed in any one of claims 25 to 27 and 29, or

b) cooking a composition as claimed in claim 23 or a premix as claimed in claim 28 wherein vitamins and/or minerals are incorporated before cooking, after cooking or after part-cooking.

and, if desired or required, adding a non-nutritional carrier before, during or after the food preparation.

33. A process as claimed in claim 32, wherein, in (a), further vitamins and/or minerals are incorporated after cooking.

34. A process as claimed in claim 32 or claim 33, wherein the addition of vitamins and/or minerals is by spraying or coating.

35. A process as claimed in claim 32, wherein, in (b), the composition or premix is first formed into a shaped article or articles and the vitamins and/or minerals are sprayed or coated onto the article or articles before cooking.

36. A biscuit manufactured by preparing a biscuit batter from the same composition as claimed in claim 21, except that vitamins are omitted; spraying or coating the biscuit batter with a solution of vitamins, and then baking; or, alternatively, backing said biscuit batter to obtain a half-finished biscuit, then spraying or coating the half-finished biscuit with a solution of vitamins, and drying.

37. A rice cracker manufactured by preparing a rice cracker batter from the same composition as claimed in claim 22, except that vitamins are omitted; spraying or coating the rice cracker batter with a solution of vitamins, and then baking; or, alternatively, baking said rice cracker batter to obtain a half-finished rice cracker, then spraying or coating the half-finished rice cracker with a solution of vitamins, and drying.

38. A process as claimed in claim 32, which is substantially as described in any one of Examples 1 to 4 herein.

39. A food whenever prepared by a process as claimed in any one of claims 32 to 37.

40. A biscuit whenever prepared by a process as claimed in any one of claims 32 to 37.

41. A rice cracker whenever prepared by a process as claimed in any one of claims 32 to 37.

42. A composition as claimed in any one of claims 1 to 24 or a premix as claimed in any one of claims 25 to 29 or a food as claimed in any one of claims 30, 31 and 39 to 41 in the form of divided doses.

43. A pack which comprises a composition as claimed in any one of claims 1 to 24 or a premix as claimed in any one of claims 25 to 29 or a food as claimed in any one of claims 30, 31 and 39 to 41, optionally in divided doses as claimed in claim 42, for one or more day's dietary allowance together with instructions for the preparation and/or ingestion of the composition or food.

44. A pack as claimed in claim 43, wherein the instructions include instructions for not ingesting one or more snacks in one day which snack or snacks together contain more than 10% of the recommended Allowance of calories per person per day.

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